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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Peter Larsson

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EXAMINER

CHOU, ALBERT T

ART UNIT

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2416

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,131	Applicant(s) LARSSON ET AL.	
	Examiner ALBERT T. CHOU	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2009 for the amendment.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-24, 31-36, 38 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/11/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicants' amendments/remarks filed on May 8, 2009 have been entered. Claims 20-38 have been amended and claim 39 has been added. Claims 20-39 are pending in this application, with claims 20, 32, 33 and 38 being independent.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the Specification:

(a). Page 21, lines 5-6, of Applicants' Specification refer to steps S2-S10 and S2 in Fig. 7. However, there are no steps S2-S10 shown in Fig. 7.

(b). Page 21, lines 22-23 and page 22, lines 1-7, of Applicants' Specification refer to a node 10, a radio transceiver 20, route determination means 30, a cost optimization 31, a cost determination 21 and means 33 and a packet forwarding 40. However, there is no any numeral designator found in Fig. 8.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the

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changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim(s) 32-39 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 of *In Re Bilski* 88 USPQ2d 1385. The instant claims are neither positively tied to a particular machine that accomplishes the claimed method steps nor transform underlying subject matter, and therefore do not qualify as a statutory process.

Regarding claim 32, *a method for cost optimization* comprising.... is broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent.

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Regarding claim 33, *a system for cost determinationcomprising means for determining a plurality of ... ; and means for determining an optical cost ...* (indeed is a software system implemented by software codes or algorithm) is broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent.

Claims 34-37 depend from claim 33 and thus are rejected on the same ground of rejection as to claim 33.

Regarding claim 38, *a node enabling cost determination...comprising: means for determining; and means for determining an optical cost ...*The node indeed a *software* node in light of its function, since it comprises a plurality of software means (there is no hardware structures associated with the node) which is broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent.

Claim 39 depends from claim 38 and thus is rejected on the same ground of rejection as to claim 38.

Claim Rejections - 35 USC § 102

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4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 20-24, 31-36 and 38-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Biswas et al., “*Opportunistic Routing in Multi-Hop Wireless Networks*”, Second Workshop on Hot Topics in Networks, ‘Online! 20 November 2003, pp. 1-6, XP002319888 (“Biswas”).

Regarding claims 20 and 33, Biswas teaches a method and a system for cost determination independent of data packet forwarding in a multihop communications network **[Title, Abstract & Fig. 1]**, comprising the steps of:

a computer-controlled node in the multi-hop communications network **[Fig.1; multi-hop wireless network comprising nodes A-D; Sec. 2]** determining a plurality of simultaneously potential next hop nodes for at least one of multiple nodes **[Fig. 1; simultaneously potential next hop nodes D, C & B; Sec. 2 & 3.1]** from a source node to a destination node in the network **[Fig. 1; e.g. a source node A and a destination node C; Sec. 2 & 3.1]**, such that said simultaneously potential nodes jointly optimize a predetermined cost function **[Fig. 1; Choose a candidate subset of**

all its neighboring nodes. e.g. Nodes “D, C, B” in Fig. 1 if originating at “A” destined for “C”, with based on the shortest path/cost (prioritized by delivery rates); Sec. 3 & 3.1], said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes **[Fig. 1; Nodes “D, C, B” in Fig. 1, form a subset of the neighboring nodes of node A; Sec. 2, 3 & 3.1]**; and

the computer-controlled node determining the optimal cost for said at least one of multiple nodes to be equal to the optimized value of the predetermined cost function **[Fig. 1; choose the shortest number of hops/path and/or deliver ratios; Sec. 2, 3 & 3.1]**, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes **[Fig. 1; the optimal cost is dependent of neighboring nodes, e.g. “D, C, B” in Fig. 1, based on the shortest number of hops/path and/or delivery ratios; Sec. 2, 3 & 3.1]**.

Regarding claims 21, 34 and 39, Biswas teaches optimizing said predetermined cost function based at least partly on an individual cost for each possible next hop node for said at least one multiple nodes **[Fig. 1; optimizing the cost based the shortest number of hops or path and/or delivery ratio of each of “D, C, B” in Fig. 1; Sec. 2, 3 & 3.1]**.

Regarding claim 22, Biswas teaches optimizing said predetermined cost function based at least partly on a cost factor due to said at least one of multiple nodes **“Fig. 1;**

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optimizing the cost based the shortest number of hops or path and/or delivery ratio (a factor) of each of “D, C, B” in Fig. 1; Sec. 2, 3 & 3.1].

Regarding claims 23 and 35, Biswas teaches determining a plurality of simultaneously potential next hop nodes and an associated optimal cost node by node, until a mesh of simultaneously potential routes is provided from the source node to the destination node **[Fig. 1; The process, i.e. determining a plurality of simultaneously potential next hop nodes and an associated optimal cost node by node, is repeated until the ultimate destination receives the packet; Sec. 3 & 3.1-3.3].**

Regarding claims 24 and 36, Biswas teaches determining link parameters that together with the plurality of simultaneously potential next hop nodes jointly optimizes a predetermined cost function **[Fig. 1; choose the shortest number of hops or path along with information from delivery ratios (which are related to the signal quality of links, transmission power, etc.); Sec. 2, 3 & 3.1].**

Regarding claim 31, Biswas teaches associating the cost for a node with at least one of delay, interference, number of hops and path loss **[Fig. 1; choose the shortest number of hops or path; Sec. 2, 3 & 3.1].**

Regarding claim 32, Biswas teaches a method for cost optimization independent of data packet forwarding in a routing protocol in a communications network **[Title,**

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Abstract, Fig. 1 & Sec. 1], further comprising optimizing a predetermined cost function **[Fig. 1; selecting the candidate forwarder set; Sec. 3 & 3.1]**, whereby an optimal cost and a plurality of simultaneously potential next hop nodes are determined for at least one of multiple nodes from a source node to a destination node **[Fig. 1; Choose a candidate subset of all its neighboring nodes. e.g. Nodes “D, C, B” in Fig. 1 if originating at “A” destined for “C”, with based on the shortest path/cost (prioritized by delivery rates); Sec. 3 & 3.1]**, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes **[Fig. 1; the optimal cost is dependent of neighboring nodes, e.g. “D, C, B” in Fig. 1, based on the shortest number of hops/path and/or delivery ratios; Sec. 2, 3 & 3.1]**, and said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes **[Fig. 1; Nodes “D, C, B” in Fig. 1, form a subset of the neighboring nodes; Sec. 2, 3 & 3.1]**.

Regarding claim 38, Biswas teaches a node enabling cost determination independent of data packet forwarding in a multihop communications network **[Title, Abstract & Fig. 1]**, comprising:

means for determining a plurality of simultaneously potential next hop nodes for said node **[Fig. 1; e.g. determining simultaneously potential next hop nodes D, C & B for a source node A; Sec. 2 & 3.1]**, such that said simultaneously potential next hop nodes jointly optimize a predetermined cost function **[Fig. 1; Choose a candidate subset of all its neighboring nodes. e.g. Nodes “D, C, B” in Fig. 1 if originating at**

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“A” destined for “C”, with based on the shortest path/cost (prioritized by delivery rates); Sec. 3 & 3.1], said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes **[Fig. 1; Nodes “D, C, B” in Fig. 1, form a subset of the neighboring nodes to node A; Sec. 2, 3 & 3.1]**; and

means for determining an optimal cost for the node to be equal to the optimized value of the predetermined cost function **[Fig. 1; choose the shortest number of hops/path and/or deliver ratios; Sec. 2, 3 & 3.1]**, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes **[Fig. 1; the optimal cost is dependent of neighboring nodes, e.g. “D, C, B” in Fig. 1, based on the shortest number of hops/path and/or delivery ratios; Sec. 2, 3 & 3.1]**.

Allowable Subject Matter

5. Claims 25-30 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Remarks

6. In light of Applicants' amendments, the 35 USC 101 rejections to claims 20-31 have been withdrawn.

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7. Applicants' remarks/amendments filed May 8, 2009 regarding the rejection of claim 38 have been fully considered but they are not moot in view of new ground of rejection.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert T. Chou whose telephone number is 571-272-6045. The examiner can normally be reached on 8:30 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham, can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Albert T Chou/

Examiner, Art Unit 2416

July 6, 2009